



EN Operating instructions.pages 1 to 6
Translation of the original operating instructions

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1. About this document

1.1 Function

This operating instructions manual provides all the information you need for the mounting, set-up and commissioning to ensure the safe operation and disassembly of the safety switchgear. The operating instructions must be available in a legible condition and a complete version in the vicinity of the device.

1.2 Target group: authorised qualified personnel

All operations described in this operating instructions manual must be carried out by trained specialist personnel, authorised by the plant operator only.

Please make sure that you have read and understood these operating instructions and that you know all applicable legislations regarding occupational safety and accident prevention prior to installation and putting the component into operation.

The machine builder must carefully select the harmonised standards to be complied with as well as other technical specifications for the selection, mounting and integration of the components.

1.3 Explanation of the symbols used



Information, hint, note:

This symbol is used for identifying useful additional information.



Caution: Failure to comply with this warning notice could lead to failures or malfunctions.

Warning: Failure to comply with this warning notice could lead to physical injury and/or damage to the machine.

1.4 Appropriate use

The products described in these operating instructions are developed to execute safety-related functions as part of an entire plant or machine. It is the responsibility of the manufacturer of a machine or plant to ensure the correct functionality of the entire machinery or plant.

The safety switchgear must be exclusively used in accordance with the versions listed below or for the applications authorised by the manufacturer. Detailed information regarding the range of applications can be found in the chapter "Product description".

1.5 General safety instructions

The user must observe the safety instructions in this operating instructions manual, the country-specific installation standards as well as all prevailing safety regulations and accident prevention rules.



Further technical information can be found in the Elan catalogues or in the online catalogue on the Internet: www.elan.de

The information contained in this operating instructions manual is provided without liability and is subject to technical modifications.



If multiple safety components are wired in series, the Performance Level to EN ISO 13849-1 will be reduced due to the restricted error detection under certain circumstances. The entire concept of the control system, in which the safety component is integrated, must be validated to EN ISO 13849-2.

There are no residual risks, provided that the safety instructions as well as the instructions regarding mounting, commissioning, operation and maintenance are observed.

1.6 Warning about misuse



In case of inadequate or improper use or manipulations of the safety switchgear, personal hazards or damage to machinery or plant components cannot be excluded. The relevant requirements of the standard EN 1088 must be observed.

1.7 Exclusion of liability

We shall accept no liability for damages and malfunctions resulting from defective mounting or failure to comply with this operating instructions manual. The manufacturer shall accept no liability for damages resulting from the use of unauthorised spare parts or accessories.

For safety reasons, invasive work on the device as well as arbitrary repairs, conversions and modifications to the device are strictly forbidden; the manufacturer shall accept no liability for damages resulting from such invasive work, arbitrary repairs, conversions and/or modifications to the device.

2. Product description

2.1 Ordering code

This operating instructions manual applies to the following types:

TZK①②③④⑤⑥

No.	Option	Description
①	M	Power to lock
	F	Power to unlock
②		Standard version
	D	Version for fitting with TZK/APLVD
③	B	Magnet: 2NC; Actuator: 1NC
	C	Magnet: 1NC/1NO; Actuator: 1NC
	E	Magnet: 2NC; Actuator: 1NO
	G	Magnet: 1NC/1NO; Actuator: 1NO
	H	Magnet: 2NC; Actuator: 2NC
	K	Magnet: 1NC/1NO; Actuator: 2NC
	M	Magnet: 1NC/1NO; Actuator: 1NC/1NO
④	P	Magnet: 2NC; Actuator: 1NC/1NO
	L	with LED indication (not for "NF and "SR and 115 and 230 VAC versions)
⑤	S	Manual release (default for TZKF...)
	SR	Lateral manual release
	N	Emergency release
	NF	Emergency exit
⑥	24 VDC	U _s 24 VDC/AC
	115 VAC	U _s 115 VAC
	230 VAC	U _s 230 VAC

Not all component variants, which are possible according to this order code, are available.



Only if the information described in this operating instructions manual are realised correctly, the safety function and therefore the compliance with the Machinery Directive is maintained.

2.2 Special versions

For special versions, which are not listed in the order code below 2.1, these specifications apply accordingly, provided that they correspond to the standard version.

2.3 Destination and use

The solenoid interlock has been designed to prevent in conjunction with the control part of a machine, movable safety guards from being opened before hazardous conditions have been eliminated.

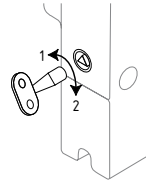


Solenoid interlocks with power to lock principle may only be used in special cases after a thorough evaluation of the risk of accident, since the safety guard can be opened immediately on failure of the power supply or upon activation of the main switch.

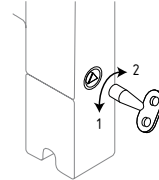
Manual release (for set-up, maintenance, etc.)

The manual release is realised by turning the triangular key (included in delivery) to the right (1), so that the locking bolt is pulled into the release position. The normal locking function is only restored after the triangular key has been returned to its original position (2). The manual release must be sealed after being put into operation (e.g. sealant etc.) to prevent its utilisation during operation. The manual release must not be actuated when loaded by the safety guard.

Manual release on the cover side Lateral manual release (Ordering suffix ..S)



Lateral manual release (Ordering suffix ..SR)

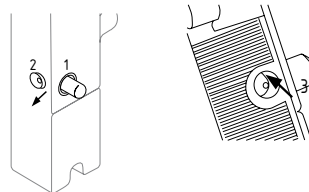


Emergency release

(mounting only on the outside of the safety guard)

Press the release button (1) to realise an emergency release. In this position, the safety guard can be opened. The release button latches. To neutralise the blocked condition, the sealing plug (2) must be opened. The power supply of the plant must be switched off prior to opening the sealing plug. Keep the locking bolt (3) pressed with a screwdriver until the release button returns to its original position. Then put the sealing plug back and seal tight. The released condition may only be cancelled by an authorised person. The emergency release must not be used when the machinery/plant is in operation.

Emergency release (ordering suffix ..N)

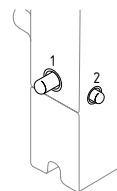


Emergency exit

(fitting and actuation only from within the hazardous area)

To release an emergency exit, the release button (1) must be pressed. In this position, the safety guard can be opened. The release button latches. To neutralise the release, the reset button (2) must be pressed. In the unlocked condition, the safety guard is protected against unintentional locking.

Emergency exit (ordering suffix ..NF)



2.4 Technical data

Standards:	IEC 60947-5-1; EN 1088; EN ISO 13849-1; BG-GS-ET-19
Enclosure:	glass-fibre reinforced thermoplastic
Actuator and locking bolt:	Galvanised steel / zinc die-cast
Protection class:	IP67, IP65 only with ordering suffix ...N and ...NF
Contact material:	Silver
Contact type:	change-over contact with double break, or 2 NC contacts, with galvanically separated contact bridges
Switching system:	⊖ IEC 60947-5-1; slow action, NC contact with positive break
Connection:	screw terminals
Cable type:	solid and stranded wire
Cable section:	0.5 - 2.5 mm ² , (max. 1.5 mm ² with conductor ferrules); components with 4 contacts: 0.5 -1.5 mm ² (incl. conductor ferrules)
Cable entry:	2 × M20 × 1,5
U _{imp} :	4 kV components with 4 contacts or 3 contacts with LED: 1.5 kV
U _i :	250 V components with 4 contacts or 3 contacts with LED: 60 VAC
I _{the} :	4 A
Utilisation category:	AC-15, DC-13
I _c /U _e :	4 A / 230 VAC; 4 A / 24 VDC; components with 4 contacts or 3 contacts with LED: AC-15: 4 A / 60 VAC
Short-circuit protection (contacts)	4 A gG, D-fuse (DIN EN 60269-1)
Positive break travel:	2 × 3.5 mm
Positive break force:	20 N
Magnet:	100% ED
U _s :	24 VDC, 24 VAC 50/60 Hz, 48 VAC 50/60 Hz, 110 VAC 50/60 Hz, 230 VAC 50/60 Hz
Power consumption:	max. 8.5 W
Actuating speed:	max. 20 m/min
Max. actuating frequency:	1.200 s/h
Ambient temperature:	0 °C ... +50 °C
Mechanical life:	1 × 10 ⁶ operations
Holding force:	1950 N
Latching force:	20 N
UL:	Listed 15 HA - Industrial Control Equipment - Enclosure Type I - "Use Copper Wire Only" - "Use 60/75° Wire Only" - Tightening Torque 0.8 Nm The hub shall be connected to the conduit before it is connected to the enclosure.

2.5 Safety classification

Standards:	EN ISO 13849-1
B _{10d} (NC contact):	2.000.000
B _{10d} (NO contact) at 10% ohmic contact load:	1.000.000
Service life:	20 years

$$MTTF_d = \frac{B_{10d}}{0,1 \times n_{op}} \quad n_{op} = \frac{d_{op} \times h_{op} \times 3600 \text{ s/h}}{t_{cycle}}$$

(Specifications can vary depending on the application-specific parameters h_{op} , d_{op} , t_{cycle} as well as the load.)

3. Mounting

3.1 General mounting instructions

Three mounting holes are provided for fixing the enclosure. The solenoid interlock is double insulated. The use of an earth wire is not authorised. The solenoid interlock must not be used as an end stop. Any mounting position. The components however must be mounted so that the opening of the actuating head is protected against the penetration of dirt (e.g. sand, dust, chips). In case of painting activities, the components must be covered. In case of horizontal mounting, the cover plate (Fig. 1) situated at the back of the actuating head must be removed. If another actuating direction is desired, the four screws of the actuating head must be loosened. Turn the actuating head in the desired direction and retighten the screws.

(Tightening torque: 0.5 Nm). The default screws installed in the actuating head can be replaced with the supplied tamperproof screws.



For power-to-unlock devices (TZKF...), the actuator must be inserted when the actuating head is turned. Any non-observance of this prescription could result in the components being damaged.



Please observe the remarks of the standards EN ISO 12100, EN 953 and EN 1088.



When used in ambient temperatures > 40°C, the solenoid interlock must be protected against contact with inflammable materials or inadvertent personal contact.

Figure 1

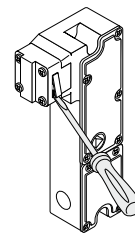
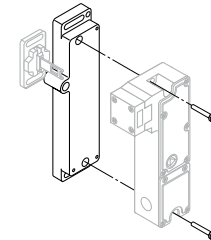
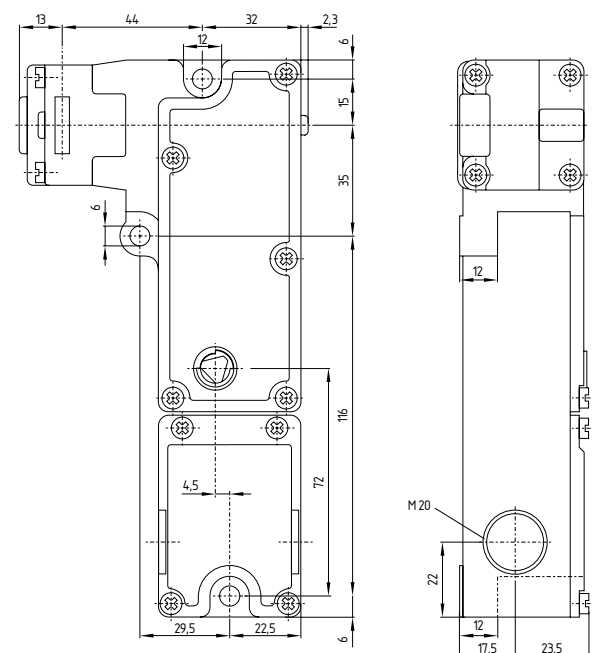


Figure 2



3.2 Dimensions

All measurements in mm.



4. Electrical connection

4.1 General information for electrical connection



The electrical connection may only be carried out by authorised personnel in a de-energised condition. At least one magnetic contact with positive break (21/22 or 31/32) must be integrated in the safety circuit. Components with LED indication only for 24VDC. The monitoring contacts of the LED versions are not potential-free. In combination with these devices, only sequential circuits can be used, in which both channels are controlled with positive potential. For the cable entry, only suitable plastic cable glands with an appropriate degree of protection must be used.

After wiring, the wiring compartment must be cleaned (i.e. remove excess cables etc.). The fixing screws of the wiring compartment cover must be tightened with 0.8 Nm tightening torque.

4.2 Contact variants

Contacts shown in a de-energised condition and with the actuator inserted.



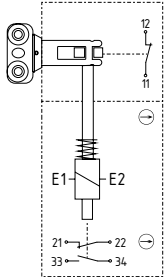
LED display:

- 1) Safety guard closed
- 2) Safety guard closed and locked
- 3) Safety guard open

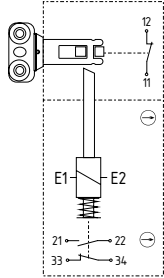
Power to unlock

Power to lock

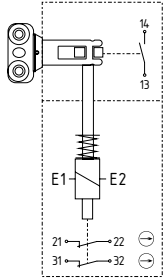
TZKF../C..



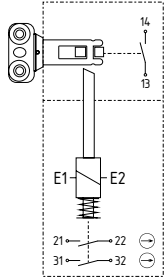
TZKM/C



TZKF../E..



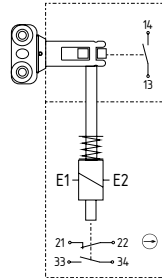
TZKM/E



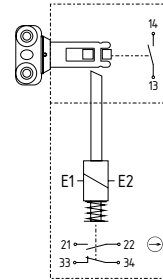
Power to unlock

Power to lock

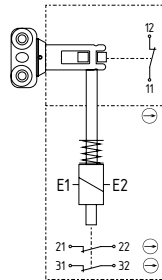
TZKF../G..



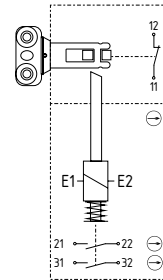
TZKM/G



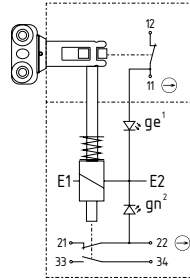
TZKF../B..



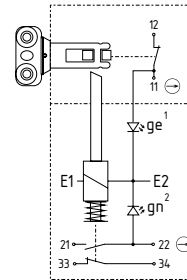
TZKM/B



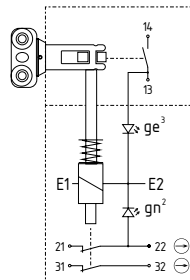
TZKF../CL..



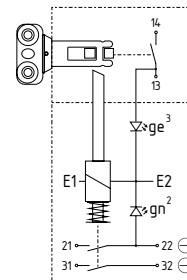
TZKM/CL



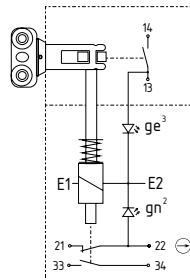
TZKF../EL..



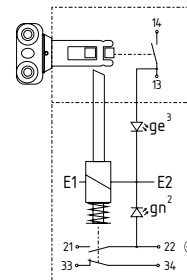
TZKM/EL



TZKF../GL..



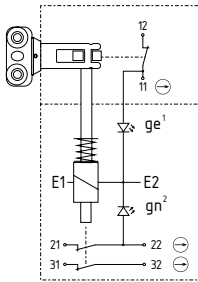
TZKM/GL



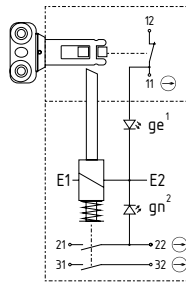
Power to unlock

Power to lock

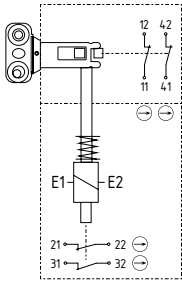
TZKF./BL..



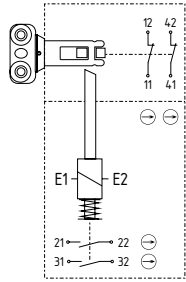
TZKM/BL



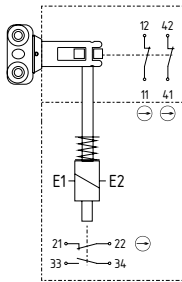
TZKF./H..



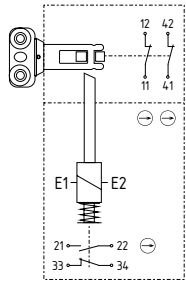
TZKM/H



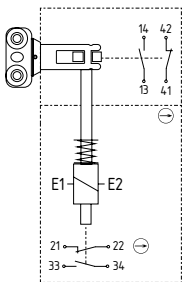
TZKF./K..



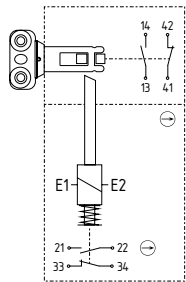
TZKM/K



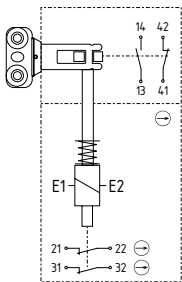
TZKF./M..



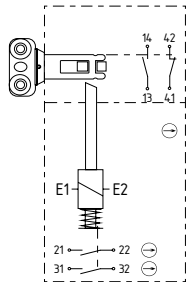
TZKM/M



TZKF./P..



TZKM/P



Legend

⊖ Positive break

5. Set-up and maintenance

5.1 Functional testing

The safety function of the safety components must be tested. The following conditions must be previously checked and met:

1. Fitting of the solenoid interlock and the actuator.
2. Check the integrity of the cable entry and connections.
3. Check the switch enclosure for damage.

5.2 Maintenance

A regular visual inspection and functional test, including the following steps, is recommended:

1. Check for tight installation of the actuator and the switch.
2. Remove particles of dust and soiling.
3. Check cable entry and connections.

Damaged or defective components must be replaced.

6. Disassembly and disposal


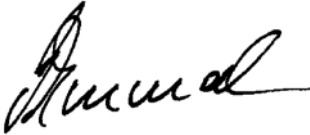
6.1 Disassembly

The safety switchgear must be disassembled in a de-energised condition only.

6.2 Disposal

The safety switchgear must be disposed of in an appropriate manner in accordance with the national prescriptions and legislations.

7.1 EC Declaration of conformity

	
<h2>EG-Konformitätserklärung</h2>	
Translation of the original declaration of conformity valid as of December 29, 2009	K. A. Schmersal GmbH & Co. KG Industrielle Sicherheitssysteme Mödinghofe 30, 42279 Wuppertal Germany Internet: www.schmersal.com
We hereby certify that the hereafter described safety components both in its basic design and construction conform to the applicable European Directives.	
Name of the safety component:	TZKM/TZKF
Type:	Refer to 2.1 Ordering code
Description of the safety component:	Interlocking device with electromagnetic interlock for safety functions (Solenoid interlock)
Harmonised EC-Directives:	2006/42/EC-EC-Machinery Directive
Person authorized for the compilation of the technical documentation:	Oliver Wacker Mödinghofe 30 42279 Wuppertal
Place and date of issue:	Wettenberg, 10. September 2009
TZK-C-EN	
	Authorised signature Philip Schmersal Managing Director



The currently valid declaration of conformity can be downloaded from the internet at www.schmersal.net.



K. A. Schmersal GmbH & Co. KG
Industrielle Sicherheitssysteme
Mödinghofe 30, D - 42279 Wuppertal
Postfach 24 02 63, D - 42232 Wuppertal

Telefon +49 - (0)2 02 - 64 74 - 0
Telefax +49 - (0)2 02 - 64 74 - 1 00
E-Mail: info@schmersal.com
Internet: <http://www.schmersal.com>